

Five-Year Review Report

Second Five-Year Review Report for Zanesville Well Field Site City of Zanesville Muskingum County, Ohio

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List of Acronyms

AOC	Administrative Order by Consent
ARAR	Applicable or Relevant and Appropriate Requirements
AS	Air Sparging
AS/SVE	Air Sparging/ Soil Vapor Extraction
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
CQAP	Construction Quality Assurance Plan
DCE	Dichloroethylene
EPA	Environmental Protection Agency
ERP	Enhanced Recovery Plan
ESD	Explanation of Significant Difference
FS	Feasibility Study
IC	Institutional Control
IRM	Interim Remedial Measure
MCL	Maximum Contaminant Levels
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
O&M	Operations and Maintenance
PCOR	Preliminary Close Out Report
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RAO	Remedial Action Objectives
RC	Restrictive Covenant
RD	Remedial Design
RD/RA	Remedial Design/ Remedial Action
RI	Remedial Investigation
RI/FS	Remedial Investigation/ Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SOW	Statement of Work
SVE	Soil Vapor Extraction
TCE	Trichloroethylene
UECA	Uniform Environmental Covenants Act
UTA	United Technologies Automotive
VOC	Volatile Organic Compound
ZMWF	Zanesville Municipal Well Field

Executive Summary

The remedy for the Zanesville Well Field Superfund Site (the site) in Zanesville, Ohio included excavation of contaminated soils, groundwater monitoring, active groundwater restoration involving groundwater pump and treat, air sparging and insitu soil vapor extraction (SVE). The site achieved construction completion with the signing of the Preliminary Close Out Report (PCOR) on September 30, 1996. The trigger for this five-year review was the signing of the first five-year report on September 27, 2001.

A protectiveness determination of the remedy could not be made at this time until further information is obtained. Further information will be obtained by taking the following actions: completion of the ERP, a vapor intrusion study and an institutional controls study. It is expected that these actions will take approximately twelve to fifteen months to complete, at which time a protectiveness determination will be made. This determination will be made in an addendum to the second five-year review in 2008.

Five-Year Review Summary Form

Site Identification		
Site Name (From WasteLAN): Zanesville Well Field Site		
EPA ID (From WasteLAN): OHD980794598		
Region: Five	State: Ohio	City/County: City of Zanesville, Muskingum County
Site Status		
NPL status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify): _____		
Remediation Status (choose all that apply): <input type="checkbox"/> Under Construction <input checked="" type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
Multiple OUs? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Construction Complete date: <u>09/30/1996</u>	
Has the site been put into reuse? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Review Status		
Lead Agency: United States Environmental Protection Agency		
Author Name: Sam Chummar		
Author Title: Remedial Project Manager	Author Affiliation: US EPA Region 5	
Review Period (Start and end dates in WasteLAN): <u>06/01/2006</u> to <u>09/30/2006</u>		
Date(s) of Inspection: <u>08/31/2006</u>		
Type of Review: <input checked="" type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion)		
Review Number: 2 (Second)		
Triggering Action: Previous Five-Year Review		
Triggering Action Date: <u>09/27/2001</u>		
Due Date: <u>09/27/2006</u>		

Five-Year Review Summary Form, Continued

Issues:

1. Groundwater
 - a. The groundwater monitoring network is not clearly demonstrating containment.
 - b. Rapid restoration of the groundwater aquifer has not been achieved.
2. A change in soil cleanup levels was not sufficiently documented.
3. A vapor intrusion (VI) study has not been completed for the site.
4. Institutional Controls
 - a. A study of institutional controls has not been completed for the site
 - b. Long-term stewardship of the site must be assured
5. Access Issues
 - a. Access, by recreational users to discharge points on Muskingum River
 - b. Access, by park visitors to wells W-6 and W-12 at the Municipal Well Field

Recommendations and Follow-up Actions:

1. Groundwater: the Enhanced Recovery Plan (ERP) will review and determine options for enhancement of the groundwater remedy system and groundwater monitoring system.
 - a. Groundwater monitoring data from the enhanced monitoring network will be used in subsequent groundwater monitoring reports to clearly demonstrate whether groundwater contamination exceeding cleanup levels is being contained.
 - b. The groundwater remedy system will be enhanced to improve the aquifer restoration timeframe.
2. Sufficient documentation will be issued for the change in soil cleanup levels.
3. A vapor intrusion study will be completed by United Technologies Automotive (UTA).
4. Institutional Controls:
 - a. An institutional controls study will be completed to evaluate institutional controls and resulting follow-up actions will be completed by UTA and EPA.
 - b. An IC Action Plan will be completed by EPA
5. Access Issues
 - a. Steps will be taken in order to prevent direct contact with discharge points
 - b. Steps will be taken in order to prevent interference with well pumps W-6 and W-12

Protectiveness Statement(s):

A protectiveness determination of the remedy could not be made at this time until further information is obtained. Further information will be obtained by taking the following actions: completion of the ERP, a vapor intrusion study and an institutional controls study. It is expected that these actions will take approximately twelve to fifteen months to complete, at which time a protectiveness determination will be made. This determination will be made in an addendum to the second five-year review in 2008.

Zanesville Well Field Site
City of Zanesville
Muskingum County, Ohio
Second Five-Year Review

I. Introduction

The purpose of five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify issues found during the review, if any, and recommendations to address them.

The Agency is preparing this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The agency interpreted this requirement further in the National Contingency Plan; 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The United States Environmental Protection Agency (EPA) Region 5 has conducted a five-year review of the remedial actions implemented at the Zanesville Well Field Site in Zanesville, Ohio. This review was conducted by the Remedial Project Manager (RPM) for the entire site from June 2006 through September 2006. This report documents the results of the review.

This is the second five-year review for the Zanesville Well Field Site. The triggering action for the policy review is the signing of the First Five-Year Review Report on September 27, 2001. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1 – Chronology of Site Events

Event	Date
Site used for manufacturing purposes	1893 – Present
Up to 121 drums containing trichloroethylene (TCE) solvent were placed inside a dug well on site	Early 1970s
Evidence of TCE contamination at the city of Zanesville's water supply Well Field	1981
Interim Remedial Measure to address impacted groundwater	July 1983
Site placed on the National Priorities List	09/08/1983
US EPA, Ohio EPA and UTA enter an <i>Administrative Order by Consent</i> (AOC) to perform a <i>Remedial Investigation/Feasibility Study</i> (RI/FS)	08/03/1988
RI/FS approved	07/10/1991
<i>Record of Decision</i> (ROD) signed	09/30/1991
<i>Consent Decree</i> (CD) to perform the <i>Remedial Design/Remedial</i> (RD/RA) entered	12/10/1992
Final RD Design Document approved	October 1995
Construction commenced	10/24/1995
<i>Preliminary Close Out Report</i> signed	09/30/1996
<i>First Five-Year Review Report</i> signed	09/27/2001

III. Background

Physical Characteristics

The Zanesville Well Field Site (the site) is located on the east and west banks of the Muskingum River in the City of Zanesville, Ohio. The east and west banks are connected via groundwater under the river. The site contains the southern portion of the water well field for the City of Zanesville and the former United Technologies Automotive, Inc. (UTA) Facility, the source of the contamination. The Zanesville Municipal Well Field (ZMWF) covers approximately 72 acres and is on a narrow strip of flood plain on the east bank of the river. The city currently pumps 5.5 to 6.0 million of gallons of water per day from 10 of the uncontaminated wells in the well field. Four of the city's production wells are no longer used for the water supply. Two of these wells (wells W-6 and W-12) are still contaminated and are being pumped as part of the remediation effort. One well that was contaminated (W-7) and one well that was never contaminated (W-8) are no longer being pumped to prevent migration of contamination to the clean wells used for the public water supply. The former UTA Facility lies on the west bank of the river directly across from the southern portion of the ZMWF. The former UTA facility and grounds cover an area of approximately 28 acres between the river and Linden Avenue.

Land and Resource Use

The property formerly occupied by UTA has been used for manufacturing purposes since 1893 when American Encaustic Tiling Company, a ceramic products manufacturer, constructed the original buildings. The site has had several owners since 1893. In 1974, UTA acquired the property from the Essex Corporation and operated at the site until ownership was transferred to the Lear Corporation who currently owns the building and property associated with the site. Residences are in close proximity to the former UTA Facility. Although residential use of the property is a possible future use of the property, Lear Corporation currently operates and plans to continue operation at the facility. The southern portion of the ZMWF is currently not being used as a source of water. After the restoration of the groundwater, this area of the well field could once again be used as a source of water.

History of Contamination

Due to the long history and varied usage of the site, many details of past waste storage and disposal practices are not available. However, it has been established that during American Encaustic's ownership of the site, a dug well 10 feet in diameter and 40 feet deep was installed. Over the years the dug well fell into disuse and in the early 1970's the well was backfilled. Rubble from the demolition of a building, as well as an estimated 121 drums containing trichloroethylene (TCE) solvents were placed inside the well.

Evidence of TCE contamination at the ZMWF was first observed in July 1981, during a random check for volatile organic compounds (VOCs) by the U.S. EPA. At that time TCE was detected in the plant tap at the City of Zanesville's water treatment plant. Three wells in the southern end of the well field were found to be contaminated with TCE and 1,2-dichloroethylene (DCE). In late 1981, the City of Zanesville was anonymously notified of the existence of the abandoned dug well at the UTA Facility, which reportedly contained drums of TCE-based solvents. The abandoned well is approximately 900 feet west of the river and directly across the river from the southern portion of the ZMWF.

Initial Response

In July 1983 UTA installed a groundwater extraction and treatment system at the site consisting of four groundwater extraction wells and an air stripper as an Interim Remedial Measure (IRM) to address impacted groundwater. At the same time UTA removed approximately 121 intact and fragmentary drums and contaminated debris from the old well and closed it. A soil vapor extraction system was implemented in 1985 to supplement the groundwater remediation system.

In September 1983 the site was placed on the National Priorities List (NPL). In August 1988 U.S. EPA, the Ohio EPA and UTA entered into an *Administrative Order on Consent* (AOC) to perform a *Remedial Investigation/Feasibility Study* (RI/FS). The RI was completed in September 1990 and the FS approved in July 1991. A *Record of Decision* (ROD), dated September 30, 1991, documented the remedial actions selected for the site.

Basis for Taking Action

Hazardous substances that have been released at the site in each media include:

Soil:

Aluminum	Chromium	Manganese	Zinc
Antimony	Copper	Mercury	
Barium	1,2-Dichloroethylene (DCE)	Trichloroethylene (TCE)	
Cadmium	Lead	Vanadium	

Groundwater:

Trichloroethylene (TCE)
1,2-Dichloroethylene (DCE)

Exposure to contaminated soil and groundwater are associated with significant human health risks, due to exceedances of EPA's risk management criteria for either the average or the reasonable maximum exposure scenarios. The risk was highest for exposures to groundwater due to the high concentrations of carcinogenic TCE and noncarcinogenic DCE that exceed State and Federal Maximum Contaminant Levels (MCLs) for drinking water. Risks from exposure to soils were significant due to the presence of carcinogenic TCE, DCE, and other noncarcinogenic hazards including high concentrations of lead and mercury.

IV. Remedial Actions

Remedy Selection

The ROD (September 30, 1991) documented the chosen remedial actions for the site. Remedial Action Objectives (RAOs) were developed as a result of data collected during the RI to aid in the development and screening of remedial alternatives to be considered for the ROD. The RAOs for the site were divided into the following:

1. Contain/capture contaminated groundwater and restore the aquifer by remediating contaminated groundwater to achieve groundwater clean up levels throughout the contamination plume;
2. Remediate source areas or prevent migration from source areas which cause groundwater to be contaminated in concentrations that exceed ARARs or risk-based levels;
3. Remediate soils to prevent contaminant migration to groundwater, or direct contact, ingestion, or inhalation with soils that contain contaminant concentrations in excess of MCLs, ARARs, or risk-based levels; and
4. Prevent inhalation of air which contains contaminant concentrations in excess of ARARs or risk-based levels.

The major components of the remedy selected in the ROD include the following:

1. Containment/capture of contaminated groundwater and restoration of the aquifer to clean up levels through groundwater pumping;
2. Treatment of contaminated groundwater by air stripping;
3. Treatment of soil and source areas contaminated with VOCs by in-situ soil vapor extraction; and
4. Treatment of soil contaminated with inorganic compounds by soil washing.

The remedial action components also included fence installation, pre-design studies, and yearly evaluation of the groundwater extraction system. In addition, the selected remedy included institutional controls such as property restrictions to control the future use of the UTA Facility until soil cleanup standards have been met and to control the use and placement of wells in the affected area until groundwater cleanup levels have been met.

Remedy Implementation

On December 10, 1992, a *Consent Decree* executed between UTA and U.S. EPA to perform the Remedial Design/Remedial Action (RD/RA) at the site was entered by the federal district court.

The RD Work Plan was approved on March 12, 1993. A series of Pre-Design Studies which included groundwater and soil sampling, pilot tests and contaminant transport modeling, were completed from May 1993 until November 1994. The Final Design Document was approved on October 18, 1995. Construction commenced on October 30, 1995.

Soil cleanup levels for organic chemicals of concern were specified in the ROD with the provision that the actual cleanup concentrations would be calculated once additional site specific data was collected during the pre-design phase. Soil cleanup levels for organic chemicals of concern were specified in the ROD with the provision that EPA may allow new cleanup concentrations to be calculated for individual chemicals as long as the overall soil cleanup level was met; i.e., contamination did not leach to groundwater above MCLs. During the early stages of the RD, modeling completed during the RI/FS was repeated with new assumptions, corresponding to new site specific information (the modeling completed during the RI/FS assumed that the initial concentration of organic contaminants in groundwater contacting contaminated soil was at MCLs; the modeling was repeated with the assumption that groundwater contacting contaminated soil was uncontaminated). The soil cleanup levels for organic chemicals of concern were modified in a letter, dated January 26, 1995, on the basis of this information.

Also modified in the letter were inorganic cleanup levels. The January 26, 1995 letter states that a UTA letter, dated November 30, 1993, EPA soil screening guidance, dated December 1994, and the EPA Region 3 risk-based concentration table, fourth quarter 1994, were used to make the modifications. The manganese cleanup level was further modified in a letter dated February 13, 1995, which states the background concentrations of manganese may be higher than the concentrations set in the January 26, 1995 letter. After modification of inorganic cleanup levels for soil, it was estimated that the volume of soil requiring treatment under the modified soil cleanup levels would be less. As a result, treatment of inorganic soil contamination by soil washing was replaced with soil excavation and off site disposal of

contaminated soil. This change in the soil remedy was approved in a letter, dated April 19, 1995, which approved the *30% Design Report for the Zanesville Well Field Site*. The method employed to document the change to the soil cleanup levels for inorganic chemicals of concern and the change from soil washing to excavation and off-site disposal is insufficient. This issue will be addressed in follow-up actions to this five year review.

The *Inorganic Soil Removal Work Plan* portion of the remedial design presented the methodology for completing the inorganic soil excavation. The excavation activities were completed in accordance with the specifications and methods outlined in the plan. The volume of soil to be excavated was estimated to be approximately 304 cubic yards. The actual volume of soil excavated to achieve the inorganic soil clean-up levels was approximately 1,880 cubic yards. Confirmation soil samples indicated that removal of inorganic impacted soils in excess of the modified soil clean-up levels had been achieved.

The results of the *Preliminary Pre-Design Data Report for the Organic Impacted Soils Investigation* did not identify any new source area of volatile organic compounds (VOCs). The only source areas identified were the Drum Storage Area and the northeast corner of the main building. As a result of this conclusion, a shallow soil vapor extraction (SVE) system was designed to focus on the Drum Storage Area and the northeast corner of the main building. The deep SVE system was designed to provide soil vapor extraction from the area of suspected deeper zone impacted soil and to provide for the extraction of vapors produced through operations of the air sparging system. Although not required in the ROD, UTA proposed air sparging (AS) as an enhancement to the required SVE system. An AS/SVE system was designed to remediate the organic impacted soils and groundwater. A total of 16 soil vapor extraction wells, five nested air sparging wells, 5,500 linear feet of conveyance piping and the AS/SVE equipment and equipment enclosure were constructed. The AS/SVE system was completed according to the technical specifications and design drawings presented in the *Final Design*. Based on the results of the AS/SVE Pilot Testing, the AS/SVE system is expected to achieve the modified clean-up standards.

The groundwater remediation system design was based on the results of groundwater modeling, groundwater sampling and analysis, the historical performance of the interim groundwater extraction and treatment system, and the results of the AS/SVE pilot test that was performed. The four existing groundwater extraction wells were incorporated into the final groundwater remediation system, as were two contaminated production wells for the ZMWF. The groundwater remediation system is expected to achieve the clean-up standards specified in the ROD. However, the groundwater remediation system has not met the goal of rapid restoration of the aquifer. Current modeling suggests that the time to achieve cleanup standards is approximately 20 years.

Construction activities at the site were consistent with the ROD and all work plans. A *Quality Assurance Project Plan* (QAPP) was approved on March 12, 1993, for all pre-design studies. All sample collection and analytical activities were conducted in accordance with the approved QAPP. The *Construction Quality Assurance Plan* (CQAP) was approved on October 12, 1995. Remedial Action (RA) work was conducted with U.S. EPA oversight. All construction activities were conducted in accordance with the approved CQAP.

System Operation/Operation and Maintenance

UTA is conducting long-term monitoring and maintenance activities according to the *Operation and Maintenance (O&M) Plan*.

The primary activities associated with the O&M include the following:

1. Inspection of conditions of groundwater monitoring wells, air sparging, SVE wells and groundwater extraction wells;
2. Environmental monitoring: biennial and yearly monitoring of the groundwater conditions; and
3. Maintenance on remediation systems: air sparge system, SVE system, and groundwater pump and treat system.

Institutional Controls

Institutional controls (ICs) are non-engineered instruments, such as administrative and legal controls that help to minimize the potential to exposure to contamination and that protect the integrity of the remedy. ICs are required to assure long-term protectiveness for any areas which do not allow for unlimited use or unrestricted exposure (UU/UE).

The ROD requires ICs to be implemented during remediation to assure protection until a health based clean-up has been achieved. Section III.B of the Statement of Work ("SOW"), Appendix B of the Consent Decree, sets forth the following requirements for ICs at the Site: "[UTA] shall implement the deed restrictions in Attachment I to prohibit the use of contaminated groundwater underlying the UTA facility, the adjacent railroad and the City of Zanesville Well Field until groundwater performance standards are met; to prohibit disturbance of the UTA facility until soil performance standards have been met; and to prohibit interference with remedial action components." Attachment 1 to the SOW sets forth specific land and groundwater use restrictions for the site.

In a letter to EPA, dated January 11, 1993, UTA stated that "a certified copy of the Consent Decree, an access agreement on behalf of United Technologies Automotive, Inc., and the Declaration of Restriction on Use of Real Property were recorded with the Muskingum County Recorder on December 23, 1992." Since 1992, significant changes have occurred that warrant a study of ICs at the site. The State of Ohio recently enacted the Ohio Uniform Environmental Covenants Act ("UECA") which allows the creation of enforceable environmental covenants that run with the land. See, ORC §§ 5301.80-5301.92. In addition, the extent of residual soil and groundwater contamination at the site has changed since UTA recorded a declaration of restrictions in 1992 because of the implementation of the cleanup remedy. Therefore, EPA has requested UTA to conduct a study of the ICs for the site. The IC study will evaluate the existing proprietary controls and encumbrances at the site, evaluate and describe areas not meeting soil or groundwater standards that require ICs, propose draft environmental covenants consistent with the UECA, and propose modifications to the Operation and Maintenance Plan for routine monitoring of compliance with use restrictions in restricted areas of the site.

Also, EPA will create an IC Plan which will include steps necessary to ensure that effective ICs are implemented and maintained. The plan will include the ongoing IC study to ensure that effective ICs have been implemented for the site as well as include provisions for long-term stewardship.

V. Five-Year Review Process

Administrative Components

The Zanesville Well Field Second Five-Year Review team included Sam Chummar, EPA's Remedial Project Manager (RPM) for the site and Michael D. Sherron, Ohio EPA's Site Coordinator for the site. EPA notified the Ohio EPA, site community involvement coordinator, Region 5 Five-Year Review Coordinator, and a representative from UTA in a letter, dated October 25, 2005, that the five year review process had begun. A public notice was placed in the July 29, 2006 edition of the Zanesville Times Recorder. The Ohio EPA and the Region 5 Five-Year Review Coordinator were provided a draft of this Five-Year Review in August 2006. Their comments have been incorporated into this report. In addition, UTA provided information which has been incorporated into this report.

Document Review

This five-year review considered relevant documents including: the site ROD, the *First Five Year Review*, *Remedial Action Construction Report*, *O&M Plan* and groundwater monitoring data. Applicable groundwater cleanup standards, as listed in the ROD were reviewed, as were post-ROD soil cleanup levels listed in the *Remedial Action Construction Report*. RAOs were obtained from the ROD.

Data Review/Groundwater Monitoring

Groundwater monitoring has been conducted at the site since the early 1980s. In general, the highest concentrations of contamination were observed during the first few years of the initial response (1983 to 1986). The TCE plume is located in the upper and middle portions of the Muskingum River Buried Valley Aquifer. On the UTA Facility side of the river, the highest concentrations of TCE are in the upper aquifer, while on the ZMWF side, the highest concentrations of TCE are in the middle portion of the aquifer. Trends show that TCE and DCE are decreasing in a majority of the wells.

UTA's groundwater monitoring reports do not fully demonstrate the capture of the contaminant plume. This uncertainty is due to a lack of data density north of ZMWF well W-12, which causes a lack of confidence in the conclusion that the pumping of W-12 is containing the contaminants (i.e. preventing the spread of contaminants). Methods to better demonstrate the capture of the target contaminant plume have been identified during the review of the Enhanced Recovery Plan (ERP), and will be implemented.

Site Inspection

A site inspection was conducted on August 31, 2006. Areas of concern at both the UTA Facility and the ZMWF were traversed with Ohio EPA Site Coordinator, Michael D. Sherron, a representative of UTA, Beth Lang, and UTA's contractor, John McInnes. A modified version of the 5 Year Review Site Inspection Checklist was used as part of the inspection and is contained in Attachment 3. No significant issues have been identified regarding the condition of the groundwater extraction wells, groundwater monitoring wells, air sparging wells, the SVE wells or the fence, except some damaged casings, missing locks and caps.

Two access issues were identified as a result of the site inspection. Access to the ZMWF wells is unrestricted because it is a park. Park goers can easily gain access to the pumps via ladders affixed to the platforms which the pumps sit upon (see Figure 1 located in Attachment 5). Interference to the remedy is possible, though unlikely, and discussions are taking place to address this issue. Secondly, the Ohio Department of Natural Resources (ODNR) installed a boat ramp at the entrance to the ZMWF. Boaters who travel a short distance upstream would have access to the outfalls where UTA discharges treated and untreated groundwater being pumped as part of the remedy (see Figure 2 located in Attachment 5). Discussions are also underway to restrict access to outfalls.

On August 31, 2006, EPA also visited the local site repository at the Muskingum County Library. EPA checked the local site repository files and found them to be in order.

Interviews

There has been low community interest in this site. This low community interest in this site is supported by the fact that neither the RPM nor the CIC has been contacted by the community in the past years. In addition, no community members responded to the five-year review public notice that invited readers to contact the CIC or the RPM for more information on the five-year review process. Therefore, no interviews were conducted with parties connected with the site.

Community Notification and Involvement

The *Comprehensive Five-Year Review Guidance* states that the community should be notified when a Five Year Review is being conducted. In accordance with guidance, a public notice was placed by EPA in the Saturday, July 29, 2006 edition of the Zanesville Times Recorder announcing the Five-Year review. A copy of the public notice is located in Attachment 4. The public notice described the Zanesville Well Field Site, stated that a five-year review of the cleanup was being conducted by EPA, and that the public could participate in the process. No comments were received in response to the public notice. EPA will provide the public with a notice of completion of this five-year review. In addition, a copy of the completed five-year review report will be provided to the local site repository.

VI. Progress Since Last Five-Year Review

This is the second five-year review for the site. The first five-year review determined the remedy would be protective after the cleanup levels were achieved for both groundwater and soil while citing similar issues with the groundwater remedy that this five-year review has identified. The first-five year review recommended an ERP be prepared for the site, which would address all the issues cited. The ERP has not been finalized yet. The draft ERP identified the following: methods of optimization for the groundwater extraction system and a timeframe of 18-20 years to achieve groundwater cleanup levels. EPA's recent review of the ERP identifies methods to demonstrate containment of target levels by the remediation system.

VII. Technical Assessments

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, risk assumptions, and the results of the site inspection indicates that a majority of the remedy is functioning as intended by the ROD.

Soil excavation minimized the migration of inorganic contaminants to groundwater and surface water, and prevents direct contact with, inhalation, or ingestion of inorganic contaminants in soil. The AS/SVE system is removing volatile organics from the soil. The groundwater pump and treat system did not achieve cleanup standards within ten years as predicted by an early groundwater model, but is removing contamination from the area, with decreasing levels of contamination documented in a majority of wells. Regular O&M has been maintaining the current effectiveness of the remedy.

The groundwater remediation, originally expected to be complete within ten years, is now estimated to take an additional 18 to 20 years assuming enhancements to the groundwater remediation system are made. Although initial models of the groundwater remediation system indicated that a rapid restoration was possible (four years for the ZMWF side of the river and ten years for the UTA side), projections from the draft ERP suggest that the initial timeframe was grossly underestimated. The underestimation may have occurred due to an underestimation of the source term in the original model, or overestimation of contaminant extraction, or more simply, the inadequacies of model algorithms of that era. Because there was no significant decrease in TCE and DCE concentration levels over a two-year consecutive period, an ERP was required. The draft ERP has not yet been approved by EPA. The draft ERP sets forth options for optimization of the groundwater remediation system's performance and for improvement of groundwater monitoring.

Improvements to groundwater monitoring are needed because the current monitoring network does not fully demonstrate containment of the target contaminants TCE and DCE. There is a lack of monitoring wells between contaminated observation wells and clean production wells for the City. Therefore, if groundwater contamination spreads, contamination of a production well for the City might occur without any prior indication by the current monitoring system. Further, several of the water level data sets analyzed do not provide substantial evidence of drawdown, due to the pumping of City Wells W-6 and W-12, which is needed to demonstrate hydraulic capture, i.e. it is unclear if the pumping of wells W-6 and W-12 are drawing groundwater from the extent of contamination on the ZMWF side of the Muskingum River. Without a clear demonstration that the contaminants are being contained, EPA is unable to determine whether the remedy is protective of human health and the environment.

The effectiveness of institutional controls is currently being studied. Affected properties are depicted in Attachment 2. On August 1, 2006, EPA requested that UTA submit an institutional controls study report. The institutional controls study report is expected to be completed by November 1, 2006. The study will evaluate the existing proprietary controls and encumbrances at the site, evaluate and describe areas not meeting soil or groundwater standards that require ICs, propose draft environmental covenants consistent with the UECA, and propose modifications to the Operation and Maintenance Plan for routine monitoring of compliance with use restrictions in restricted areas of the site. Once EPA reviews and

approves the study, steps will be taken to ensure institutional controls for the site are implemented and maintained.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. Land uses on both sides of the river have not changed and expected uses of both properties have not changed since the selection of the remedy. Exposure assumptions and pathways evaluated during the remedy selection are still valid however vapor intrusion was not considered during the remedy selection. TCE and DCE, which are volatile organic chemicals (VOCs), contaminated soil and groundwater in close proximity to an existing building. VOCs from soil and groundwater in proximity to buildings have been known to vaporize and enter buildings through cracks, spaces, or by permeating through the foundation materials of those buildings. VOCs discovered in close proximity to a building is sufficient information to trigger additional investigation as prescribed in the *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils*. This pathway should be evaluated to ensure the remedy is comprehensive and protective. Cleanup levels for groundwater have not changed, are still consistent with National Primary Drinking Water Standards, and are consequently considered still protective.

Soil cleanup levels were modified during the initial stages of the RD, and fall into two categories: risk-based and leaching-based. The ROD provides soil cleanup levels for TCE and DCE based upon potential for leaching into groundwater at levels higher than the MCLs. Modeling that took place during the RD utilized assumptions reflective of site conditions and allowed for less stringent cleanup levels while still satisfying RAOs. New cleanup levels were issued in a letter, dated January 26, 1995. These modified criteria for organic COCs are consistent with the intentions of the ROD and are also considered protective of the environment. Inorganic chemicals of concern (COCs) fall into the risk-based category. ROD soil cleanup levels for inorganic COCs at the site were determined based on a risk calculation. However, no record of a risk calculation for the modified soil cleanup levels were located during the five-year review. Without a risk calculation of the modified soil cleanup levels, a determination of the protectiveness of the modified soil cleanup levels cannot be made at this time. The appropriate documentation for the modification of the soil cleanup levels should be completed in order to provide the information needed to make a protectiveness determination.

There has been no change to toxicity data of parent contaminants (TCE & DCE), but daughter products (e.g. vinyl chloride) were not considered as contaminants of concern (COCs) in the ROD. Sporadic detection of daughter products has been observed. However, since no consistent detection has been observed at any location, daughter products are still not being considered as COCs. Should monitoring reveal consistent detection at any location of any daughter product, it should then be considered a COC, and an evaluation should be made to determine if the current remedy is able to address the new COC. RAOs at the site are still valid.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

No other information has come to light that could call into question the protectiveness of the remedy.

Technical Assessment Summary

According to the data reviewed and the site inspection, much of the remedy is functioning as intended. However, rapid restoration of the groundwater aquifer, a goal of the ROD, has not been achieved. Restoration of the groundwater aquifer using the current remediation system has been estimated to take an additional 20 years. In addition, containment of groundwater contamination plume, another objective of the ROD, has not been clearly demonstrated. Biennial reports received from UTA do not demonstrate capture due to a lack of monitoring wells on the ZMWF side of the river.

RAOs and exposure pathways are still valid. However, vapor intrusion has not been considered as an exposure pathway. TCE and DCE are VOCs, and they contaminate soil and groundwater in close proximity to an existing building at the site. VOCs from contaminated soil and groundwater in proximity to buildings have been known to vaporize and enter buildings through cracks, spaces, or by permeating through the foundation materials of those buildings. This pathway has been found complete at some older Superfund sites with volatile organic compounds because the vapor intrusion pathway was not evaluated during investigations that took place. Not until recent years has it been common practice to evaluate the vapor intrusion pathway. In addition, adequate documentation was not provided for the decision to change the soil cleanup levels. Without this documentation, a determination of whether the cleanup levels for inorganic COCs are protective cannot be made.

VIII. Issues

Table 2 – Issues

Issue Number	Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
1a	Groundwater monitoring network is not clearly demonstrating containment.	N	Y
1b	Rapid restoration of groundwater aquifer has not been achieved.	N	Y
2	A change in soil cleanup levels was not sufficiently documented	Y	Y
3	Vapor Intrusion was not studied as a possible pathway.	Y	Y
4a	The effectiveness of institutional controls requires study because of changes since their implementation in 1992	N	Y
4b	Long-term stewardship of the site must be assured	N	Y
5a	Direct access to discharge points	Y	Y
5b	Direct access to wells W-6 and W-12	Y	Y

IX. Recommendations and Follow-Up Actions

Table 3 – Recommendations and Follow-Up Actions

Issue Number	Issues	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
						Current	Future
1a	Monitoring network not clearly demonstrating containment	ERP to be completed and implemented.	UTA	EPA	12/2007	N	Y
1b	Rapid restoration of groundwater aquifer not achieved	ERP to be completed and implemented.	UTA	EPA	12/2007	N	Y
2	Proper documentation	Determine and complete proper documentation	EPA	-	12/2007	N	Y
3	Vapor Intrusion pathway	Study to be completed	UTA	EPA	12/2007	Y	Y
4a	Effectiveness of institutional controls.	Study to be completed and follow-up actions implemented.	UTA	EPA	12/2007	N	Y
4b	Long-term stewardship	Complete IC Action Plan	EPA	-	04/2007 ¹	N	Y
5a	Direct access to discharge points	Steps will be taken in order to prevent direct contact with water discharging from wells	UTA	EPA	12/2007	Y	Y
5b	Direct access to W-6 and W-7	Steps will be taken in order to prevent interference with well pumps on W-6 and W-12	UTA	EPA	12/2007	Y	Y

¹ Completion of the IC Action Plan by EPA is dependent on the completion of other items including the IC study, the vapor intrusion study, and the resolution of issues related to the soil cleanup levels. It is unlikely that all of these items will be completed by the IC Action Plan milestone date of April 2007. Therefore, the milestone date is likely to be extended.

X. Protectiveness Statement

A protectiveness determination of the remedy could not be made at this time until further information is obtained. Further information will be obtained by taking the following actions: completion of the ERP, a vapor intrusion study and an institutional controls study. It is expected that these actions will take approximately twelve to fifteen months to complete, at which time a protectiveness determination will be made. This determination will be made in an addendum to the second five-year review in 2008.

XI. Next Review

An addendum to the second five-year review will be completed in 2008 in order to make a protectiveness determination. The next five-year review for the Zanesville Well Field Site is required by September 2011, five years from the date of this second five-year review.

Attachment 1 – Site Location

Site Location

Superfund
U.S. Environmental Protection Agency



Zanesville Well Field Muskingum County, OH

OHD980794598



State



County

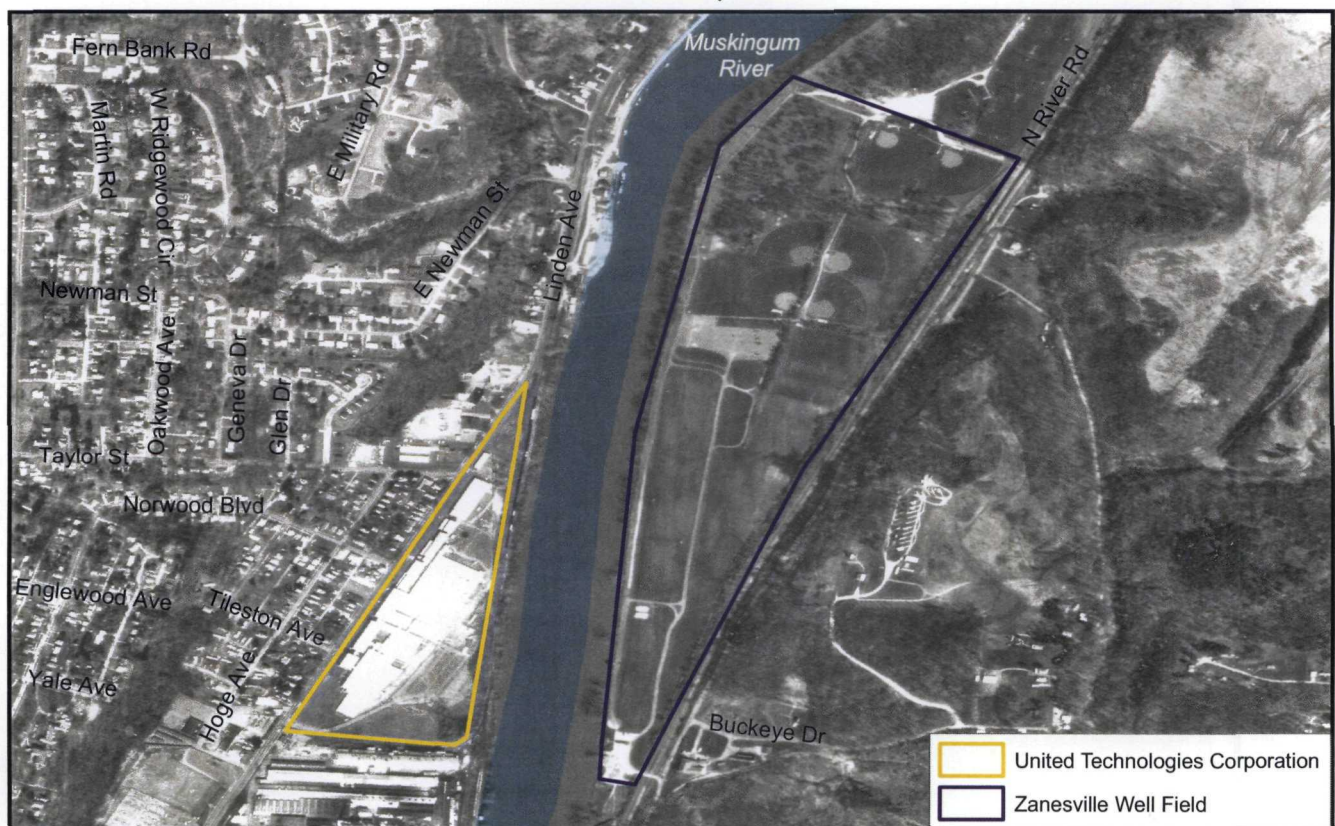


Figure 1

Created by Sarah Backhouse
U.S. EPA Region 5 on 8/24/06

Site

L

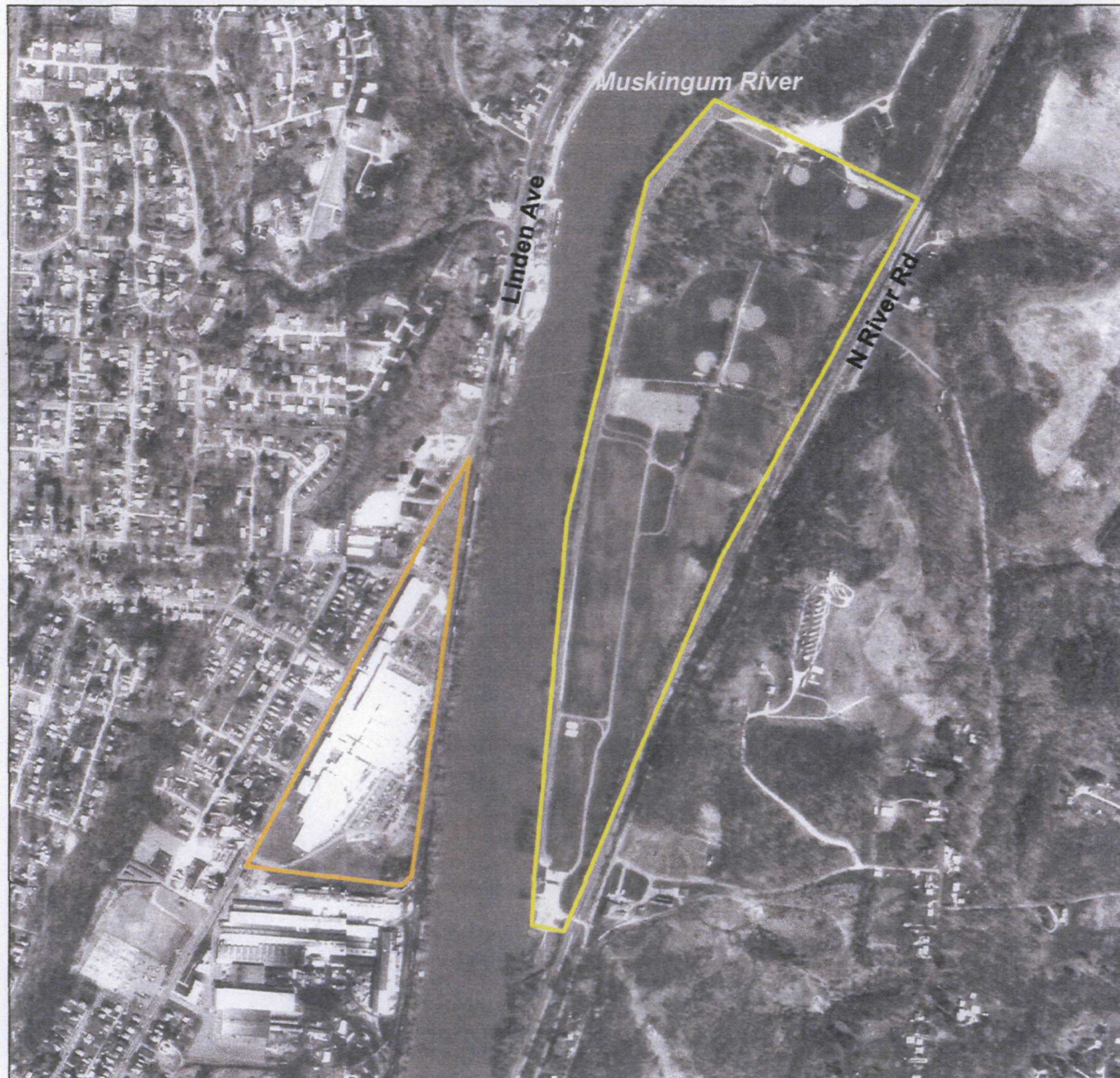


Attachment 2 – Site Properties





Zanesville Well Field
Muskingum County, OH

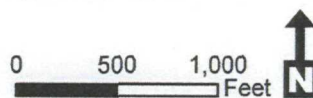
OHD980794598



Legend

-  UTA Building
-  Zanesville Well Field

RPM: Sam Chummar



Created by Sarah Backhouse
U.S. EPA Region 5 on 5/11/06

Attachment 2 – Site Properties

Attachment 3 – Inspection Checklist

5 Year Review Site Inspection Checklist

I. SITE INFORMATION													
Site name: Zanesville Well Field	Date of inspection: 08/31/2006												
Location and Region: Zanesville Ohio, Region 5	EPA ID: OHD980794598												
Agency, office, or company leading the five-year review: US EPA	Weather/temperature: <i>Cloudy, 60s-70s</i>												
Remedy Includes: (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Landfill cover/containment</td> <td><input type="checkbox"/> Monitored natural attenuation</td> </tr> <tr> <td><input type="checkbox"/> Access controls</td> <td><input type="checkbox"/> Groundwater containment</td> </tr> <tr> <td><input checked="" type="checkbox"/> Institutional controls</td> <td><input type="checkbox"/> Vertical barrier walls</td> </tr> <tr> <td><input checked="" type="checkbox"/> Groundwater pump and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Surface water collection and treatment</td> <td></td> </tr> <tr> <td colspan="2"><input checked="" type="checkbox"/> Other: <u>Air Sparging/Soil Vapor Extraction</u></td> </tr> </table>		<input type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation	<input type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment	<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls	<input checked="" type="checkbox"/> Groundwater pump and treatment		<input type="checkbox"/> Surface water collection and treatment		<input checked="" type="checkbox"/> Other: <u>Air Sparging/Soil Vapor Extraction</u>	
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<input type="checkbox"/> Surface water collection and treatment													
<input checked="" type="checkbox"/> Other: <u>Air Sparging/Soil Vapor Extraction</u>													
Attachments: <input type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached													
II. INTERVIEWS (Check all that apply)													
1. O&M site manager _____ <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="text-align: center;">Name</td> <td style="text-align: center;">Title</td> <td style="text-align: center;">Date</td> </tr> <tr> <td colspan="3"> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____ </td> </tr> <tr> <td colspan="3"> Problems, suggestions; <input type="checkbox"/> Report attached _____ </td> </tr> </table>		Name	Title	Date	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached _____					
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Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____													
Problems, suggestions; <input type="checkbox"/> Report attached _____													
2. O&M staff _____ <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="text-align: center;">Name</td> <td style="text-align: center;">Title</td> <td style="text-align: center;">Date</td> </tr> <tr> <td colspan="3"> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____ </td> </tr> <tr> <td colspan="3"> Problems, suggestions; <input type="checkbox"/> Report attached _____ </td> </tr> </table>		Name	Title	Date	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached _____					
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Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____													
Problems, suggestions; <input type="checkbox"/> Report attached _____													

5 Year Review Site Inspection Checklist

3.	Local regulatory authorities and response agencies (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.																
<div style="margin-bottom: 10px;"> Agency _____ Contact _____ <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 45%; text-align: center;">Name</td> <td style="width: 20%; text-align: center;">Title</td> <td style="width: 15%; text-align: center;">Date</td> <td style="width: 20%; text-align: center;">Phone no.</td> </tr> </table> Problems; suggestions; <input type="checkbox"/> Report attached _____ _____ </div> <div style="margin-bottom: 10px;"> Agency _____ Contact _____ <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 45%; text-align: center;">Name</td> <td style="width: 20%; text-align: center;">Title</td> <td style="width: 15%; text-align: center;">Date</td> <td style="width: 20%; text-align: center;">Phone no.</td> </tr> </table> Problems; suggestions; <input type="checkbox"/> Report attached _____ _____ </div> <div style="margin-bottom: 10px;"> Agency _____ Contact _____ <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 45%; text-align: center;">Name</td> <td style="width: 20%; text-align: center;">Title</td> <td style="width: 15%; text-align: center;">Date</td> <td style="width: 20%; text-align: center;">Phone no.</td> </tr> </table> Problems; suggestions; <input type="checkbox"/> Report attached _____ _____ </div> <div> Agency _____ Contact _____ <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 45%; text-align: center;">Name</td> <td style="width: 20%; text-align: center;">Title</td> <td style="width: 15%; text-align: center;">Date</td> <td style="width: 20%; text-align: center;">Phone no.</td> </tr> </table> Problems; suggestions; <input type="checkbox"/> Report attached _____ _____ </div>		Name	Title	Date	Phone no.	Name	Title	Date	Phone no.	Name	Title	Date	Phone no.	Name	Title	Date	Phone no.
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4.	Other interviews (optional) <input type="checkbox"/> Report attached.																

5 Year Review Site Inspection Checklist

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	O&M Documents <input checked="" type="checkbox"/> O&M manual <input checked="" type="checkbox"/> As-built drawings <input checked="" type="checkbox"/> Maintenance logs Remarks _____	<input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	<input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A
2.	Site-Specific Health and Safety Plan <input checked="" type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	<input type="checkbox"/> N/A <input type="checkbox"/> N/A
3.	O&M and OSHA Training Records Remarks _____	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
4.	Permits and Service Agreements <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
5.	Gas Generation Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
6.	Settlement Monument Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
7.	Groundwater Monitoring Records Remarks _____	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
8.	Leachate Extraction Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
9.	Discharge Compliance Records <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
10.	Daily Access/Security Logs Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A

5 Year Review Site Inspection Checklist

IV. O&M COSTS																																											
1.	O&M Organization <input type="checkbox"/> State in-house <input type="checkbox"/> Contractor for State <input type="checkbox"/> PRP in-house <input type="checkbox"/> Contractor for PRP <input type="checkbox"/> Federal Facility in-house <input type="checkbox"/> Contractor for Federal Facility <input type="checkbox"/> Other _____ _____ _____																																										
2.	O&M Cost Records <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input type="checkbox"/> Funding mechanism/agreement in place Original O&M cost estimate _____ <input type="checkbox"/> Breakdown attached <p style="text-align: center;">Total annual cost by year for review period if available</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">From _____</td> <td style="width: 20%;">To _____</td> <td style="width: 40%;"></td> <td style="width: 20%;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> </table>			From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost	
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3.	Unanticipated or Unusually High O&M Costs During Review Period Describe costs and reasons: _____ _____ _____ _____ _____																																										
V. ACCESS AND INSTITUTIONAL CONTROLS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A																																											
A. Fencing																																											
1.	Fencing damaged <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Gates secured <input type="checkbox"/> N/A Remarks _____ _____ _____																																										
B. Other Access Restrictions																																											
1.	Signs and other security measures <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A Remarks _____ _____ _____																																										

5 Year Review Site Inspection Checklist

C. Institutional Controls (ICs)				
1. Implementation and enforcement				
Site conditions imply ICs not properly implemented		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Site conditions imply ICs not being fully enforced		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Type of monitoring (e.g., self-reporting, drive by) _____				
Frequency _____				
Responsible party/agency _____				
Contact _____				
	Name	Title	Date	Phone no.
Reporting is up-to-date		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Reports are verified by the lead agency		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Specific requirements in deed or decision documents have been met		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Violations have been reported		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Other problems or suggestions: <input type="checkbox"/> Report attached				

2. Adequacy <input checked="" type="checkbox"/> ICs are adequate <input type="checkbox"/> ICs are inadequate <input type="checkbox"/> N/A				
Remarks _____				

D. General				
1. Vandalism/trespassing <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No vandalism evident				
Remarks _____				

2. Land use changes on-site <input checked="" type="checkbox"/> N/A				
Remarks <u>well field is now a park.</u>				

3. Land use changes off site <input type="checkbox"/> N/A				
Remarks _____				

VI. GENERAL SITE CONDITIONS				
A. Roads <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A				
1. Roads damaged <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Roads adequate <input type="checkbox"/> N/A				
Remarks _____				

5 Year Review Site Inspection Checklist

B. Other Site Conditions	
Remarks	
IX. GROUNDWATER/SURFACE WATER REMEDIES <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	Pumps, Wellhead Plumbing, and Electrical <input type="checkbox"/> Good condition <input checked="" type="checkbox"/> All required wells properly operating <input checked="" type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks <u>some well casings in need of repair</u>
2.	Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____
3.	Spare Parts and Equipment <input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____
B. Surface Water Collection Structures, Pumps, and Pipelines <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	Collection Structures, Pumps, and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____
2.	Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____
3.	Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____

5 Year Review Site Inspection Checklist

C. Treatment System		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	Treatment Train (Check components that apply) <input type="checkbox"/> Metals removal <input type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation <input checked="" type="checkbox"/> Air stripping <input checked="" type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters _____ <input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____ <input type="checkbox"/> Others _____ <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input checked="" type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually _____ <input type="checkbox"/> Quantity of surface water treated annually _____ Remarks _____		
2.	Electrical Enclosures and Panels (properly rated and functional) <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____		
3.	Tanks, Vaults, Storage Vessels <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____		
4.	Discharge Structure and Appurtenances <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input checked="" type="checkbox"/> Needs Maintenance Remarks <u>grate covering stripper discharge and</u> <u>50+ falls could use some support</u>		
5.	Treatment Building(s) <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input checked="" type="checkbox"/> Chemicals and equipment properly stored Remarks _____		
6.	Monitoring Wells (pump and treatment remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input checked="" type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks <u>some need locks, some need maintenance</u>		
D. Monitoring Data			
1.	Monitoring Data <input checked="" type="checkbox"/> Is routinely submitted on time <input type="checkbox"/> Is of acceptable quality		
2.	Monitoring data suggests: <input type="checkbox"/> Groundwater plume is effectively contained <input checked="" type="checkbox"/> Contaminant concentrations are declining		

5 Year Review Site Inspection Checklist

D. Monitored Natural Attenuation			
1.	Monitoring Wells (natural attenuation remedy) <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> All required wells located Remarks _____ </div> <div> <input type="checkbox"/> Functioning <input type="checkbox"/> Needs Maintenance </div> <div> <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input checked="" type="checkbox"/> N/A </div> </div>		
X. OTHER REMEDIES			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
XI. OVERALL OBSERVATIONS			
A. Implementation of the Remedy			
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> The remedy includes SVE and pump and treat. Both mechanisms seem to be working, though the SVE system needs some maintenance. The two wells that need servicing are close to reaching criteria so they may need not to be fixed for confirmation sampling. SVE wells are under pavement, so they could not be inspected but treatment system was in good condition and mechanisms were functioning. </div>			
B. Adequacy of O&M			
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. <div style="border: 1px solid black; height: 150px; margin-top: 5px;"></div>			

5 Year Review Site Inspection Checklist

C.	Early Indicators of Potential Remedy Problems
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.	
<p>There are a couple access issues:</p> <p>1) City wells are accessible.</p> <p>- The wells part of the remedy are easily accessible, and to the public, and interference is possible</p> <p>2) Outfalls</p> <p>- ODNK installed a boat ramp upstream and that could lead to boaters and swimmers near the outfall.</p>	
D.	Opportunities for Optimization
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.	
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Attachment 4 – Public Notice

8/8/06

Rev:

SAT. 9/29/06

ZANESVILLE TIMES

Recorder...



EPA Reviewing Cleanup of Zanesville Well Field Site Zanesville, Ohio

U.S. Environmental Protection Agency Region 5 is conducting a review of the cleanup performed at the Zanesville Well Field site in Zanesville, Ohio. Reviews are done at least every five years as part of the Superfund law to ensure the site cleanup continues to protect human health and the environment. The site includes the former United Technologies facility located on Linden Avenue west of the Muskingum River and the Zanesville municipal well field across the river from the industrial area.

A common industrial solvent called trichloroethylene (TCE) contaminated three of the city's drinking water wells in the early 1980s. Those three wells were closed as a drinking water source. The cleanup processes constructed at the site in 1997 included pumping and treating polluted underground water supplies (ground water), removing metal-contaminated soil and removing TCE and other chemicals from the ground through a soil-vapor extraction system. The ground-water treatment and soil-vapor extraction systems are still operating, and regular monitoring is being performed to ensure ground-water contamination is not spreading to other city wells. The last review of the site was done in 2001 and found the ongoing cleanup was protecting people and the environment. During the 2001 review, a plan to improve the ground-water cleanup was started, and EPA estimates that plan will be finished next summer.

The current five-year review includes a site inspection and review of documents and monitoring data to make sure the cleanup systems are still working. The latest five-year review report will be available at the Muskingum County Library by Nov. 1. The public can participate in the process by making comments or asking questions about the review. These EPA employees can be contacted:

Sam Chummar

or **Rafael P. Gonzalez**

EPA Remedial Project Manager

EPA Community Involvement Coordinator

chummar.sam@epa.gov

gonzalez.rafaelp@epa.gov

Region 5 toll-free: (800) 621-8431, weekdays 10 a.m. - 5:30 p.m.

More details about the cleanup are contained in an EPA fact sheet and technical documents available at the **Muskingum County Library, 220 N. Fifth St., Zanesville.**

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Attachment 5 – Photos from Site Visit



Figure 1. City Well W-12. Pump is located on top of platform.



Figure 2. Discharge from City Well W-12